

REMARKS ON THE TANAIIDACEA (CRUSTACEA: ISOPODA)
OF AUSTRALIA: ON *BILOBATUS CRENULATUS* GEN. ET SP. NOV.,
FROM PORT DARWIN.

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ABSTRACT

A new tanaidacean, *Bilobatus crenulatus* gen. et sp. nov., is described from shallow Australian waters at Port Darwin, Northern Territory. Its possible phylogenetic position is discussed and finally a short overview is given of those members of the suborder Apseudomorpha recorded from Australia.

KEYWORDS: Tanaidacea - Australia, Tanaidacea, Apseudomorpha, new genus, new species, *Bilobatus crenulatus* sp. nov., Port Darwin.

INTRODUCTION

The Australian tanaidacean fauna is very poorly known. At present only eleven species belonging to the suborder Apseudomorpha are known, exclusively from the eastern and southeastern coasts of Australia. Haswell (1882a, 1882b) first described *Kalliapseudes obtusifrons* as *Apseudes obtusifrons* and *A. australis*. Whitelegge (1901) added *A. multicauiatus* and established the genus *Pagurapseudes* for his new species *P. spinipes*. Lang (1970) added a further species, *Pseudowhiteleggia typica*, transferred *A. multicauiatus* Whitelegge, 1901, to the newly created genus *Whiteleggia*, and mentioned a *Synapseudes* sp. Three years later, Boesch (1973) added three further species, *Apseudes caeruleus*, *A. estuarius* and *Whiteleggia stephensoni*. Finally, Bacescu (1981) described *Synapseudes australiamus* (with which Lang's *Synapseudes* sp. probably is conspecific), *Pagurapseudes abrucei*, and *Macrolabrum boeri*.

As the classification of the suborder Apseudomorpha has changed considerably in the last two decades, the present taxonomic position of each species is given in Table 1.

As mentioned by Boesch (1981:187), the number of presently known species can represent only a very small portion of the existing coenoses. Considering the geological history of Australia, it should not be surprising to find

species that will play an important role for the reconstruction of the possible evolution of the suborder Apseudomorpha. Therefore, careful description is always needed so that later on those data necessary for phylogenetic reconstructions can be obtained easily from the original description.

The following abbreviations are used within the text: A.1 = first antenna, A.2 = second antenna, L = labrum, Md_(r) = right mandible, Md_(l) = left mandible, Mx.1 = first maxilla, Mx.2 = second maxilla, La = labium (= hypopharynx), Mxp = maxilliped, Epi = epignath (= maxillipedal epipodite), Chc = cheliped, P.1 - P.6 = pcreopod 1 to pereopod 6, Pl.1 - Pl.5 = pleopod 1 to pleopod 5, Plt = pleotelson, Uro = uropod, NTM = Northern Territory Museum of Arts and Sciences, Darwin.

SYSTEMATICS

Bilobatus gen. nov.

Diagnosis. Body dorsoventrally flattened; cephalothorax with eyelobes with terminal spinelike structure, without visual elements; eye-lobe and carapace area marked by indentation; first and second preonite of typical apseudoidcan shape, fourth to sixth with bilobed lateral margins, gap between both lobes quite broad, lateral

Table 1. List of Australian apseudomorphan Tanaidacea.

Apseudidae Leach, 1814	
<i>Apseudes australis</i> Haswell, 1882a	southeast Australia
<i>Apseudes caeruleus</i> Boesch, 1973	Queensland (Moreton Bay)
<i>Apseudes estuarius</i> Boesch, 1973	Queensland (Brisbane and Fitzroy River estuaries)
Kalliapseudidae Lang, 1956	
<i>Kalliapseudes obtusifrons</i> (Haswell, 1882b) [originally placed within <i>Apseudes</i>]	New South Wales (Port Jackson), but probably widespread in eastern Australia
Metapseudidae Lang, 1970	
<i>Synapseudes australianus</i> Bacescu, 1981 (?= <i>Synapseudes</i> sp. Lang, 1970)	Queensland (Heron Island), ? New South Wales (Port Jackson Head)
Pagurapseudidae Lang, 1970	
<i>Macrolabrum borei</i> Bacescu, 1981	Queensland (Heron Island)
<i>Pagurapseudes abrucei</i> Bacescu, 1981	Queensland (Heron Island)
<i>Pagurapseudes spinipes</i> Whitelegge, 1901	southeast Australia
Whiteleggiidae Gutu, 1972 (subfamily Whiteleggiinae)	
<i>Pseudowhiteleggia typica</i> Lang, 1970	off New South Wales (Galathea Sta. 544: 29°27'S 153°22'E)
<i>Whiteleggia multicarinata</i> (Whitelegge, 1901) [originally placed within <i>Apseudes</i>]	southeast Australia, off Atlantic coast of South Africa
<i>Whiteleggia stephensoni</i> Boesch, 1973	Queensland (Moreton Bay)

parts of both lobes crenulated to various degrees; all five pleonites with epimeres with barbed setae; pleotelson elongate, with small lateral projections, caudal point prominent; A.1 biflagellate; A.2 5-segmented, with well developed scale; mouthparts of typical shape; Md with 3-segmented palpus, Md₍₁₎ with well developed lacinia mobilis. Md_(r) with a reduced, spine-like lacinia mobilis; inner medial seta of maxillipedal endite not transformed; Che with 3-segmented exopodite; P.1 of digging type, without exopodite; P.2 - P.5 not transformed, mostly of walking type; P.6 transformed, margins of basis to carpus covered by strong plumose setae, distorostral border of propodus with row of small serrate spines; pleopods biramous, exo- and endopodite 1-segmented; Uro biramous, endopodite multisegmented and slender, exopodite distinctly shorter.

Marsupium consisting of four pairs of oostegites; male unknown.

Type-species. *Bilobatus crenulatus* sp. nov.

Gender. Masculine.

Etymology. The name is taken from the Latin "*bilobus*" and refers to the cleft lateral margins of pereonites 4-6.

Remarks. This genus is easily recognised by the bilobed lateral margins of pereonites 4-6. No other apseudoidean genus has been reported to have this characteristic feature.

The genus belongs to that part of the Apseudidae which falls within the section III of the superfamily Apseudoidea as defined by Sieg

(1984). It is related to genera such as *Halmyrapseudes* Bacescu and Gutu, 1975, and *Discapseudes* Bacescu and Gutu, 1975. From these it differs in body-shape and structure of the P.1. In *Bilobatus* there are strongly developed spines on the merus, carpus, and propodus while the two above mentioned genera bear setae nearly exclusively on these pereopodal segments. Another important difference is found in the P.2 - P.3, as these are not transformed into a digging leg as in *Halmyrapseudes* or *Discapseudes*.

Nevertheless, the proper relationships of different apseudoidean genera can be defined only after revision of further genera.

***Bilobatus crenulatus* sp. nov.**
(Figs 1-5)

HOLOTYPE - NTM Cr. 005010a: 1 female with rud. oostegites, Creek H, Darwin Harbour, Station No. CH9, low water spring tide, 13 March 1986, coll. R. Hanley *et al.*

PARATYPES - NTM Cr. 005010b: 1 female, with rud. oostegites, and 1 with rud. oostegites, dissected, from type locality; NTM Cr. 005034: 1 female with marsupium and eggs, East Point, Darwin Harbour, Station No. ABJ-33, silty pool at low water spring tide, 15 April 1987, coll. A. J. Bruce; NTM Cr. 001964: 1 female with rud. oostegites, and 1 female dissected, Table Head, Port Essington, Station No. CP-38, 2-4m, from rubble of rocky reef, 04 May 1982, coll. H. Larson.

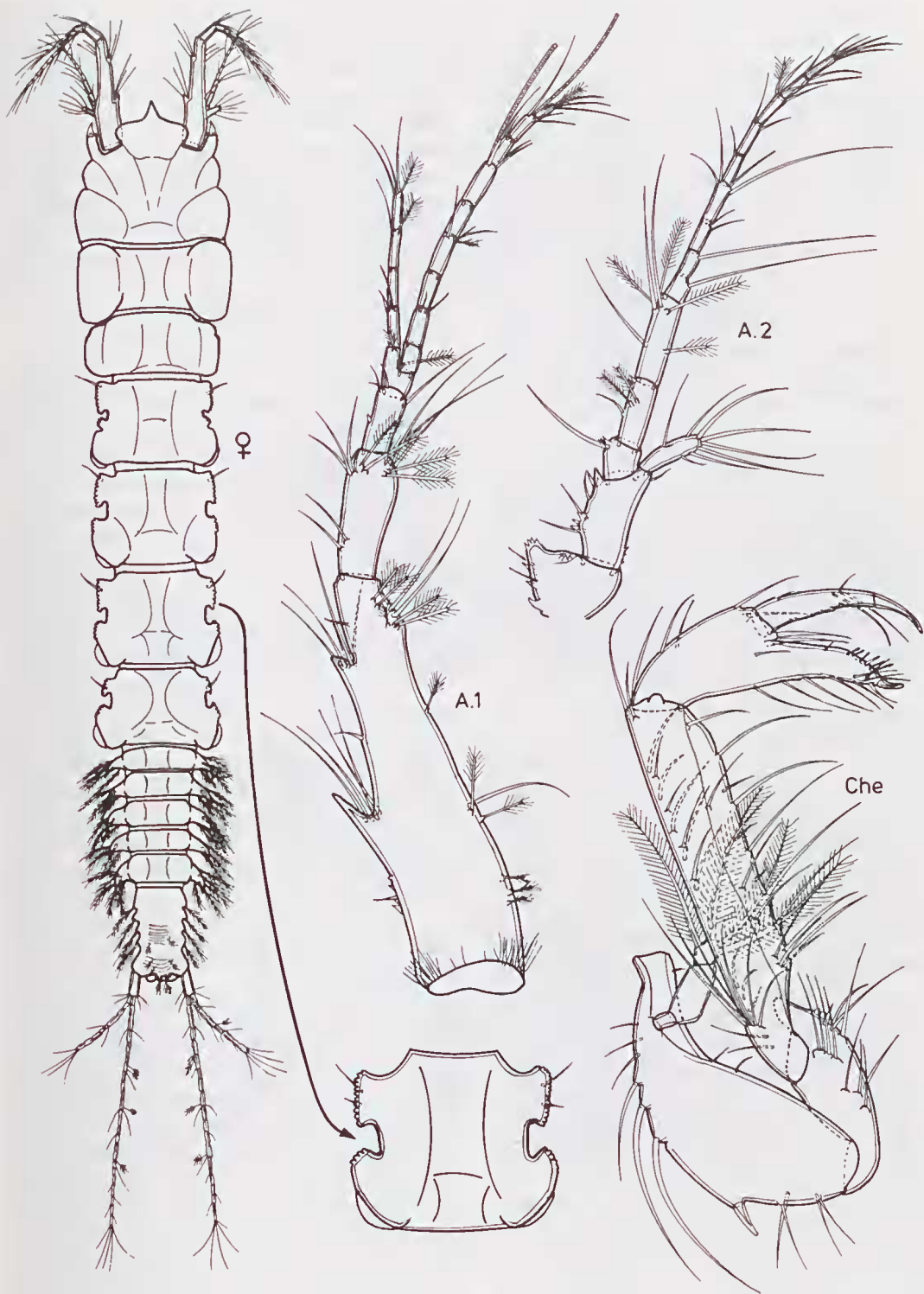


Fig. 1. *Bilobatus crenulatus* gen. et sp. nov., female, paratype, whole animal, antennae 1, antennae 2 and cheliped.

Description of female (paratype). *Body* (Fig. 1). Length about 8.5 mm (without uropods).

Cephalothorax as long as broad (from tip to rostrum), with two lateral indentations marking eye-lobe and carapace area; eye-lobe present; rostrum broad, with strongly developed keel-like, pointed tip, lateral margins rounded; postorbital and carapace area with curved margins.

Pereonite 1: width about twice length, lateral margins slightly curved, without any extraordinary structures, 2.2 times broader than long; pereonites 4 - 6 of similar shape, fourth and fifth about 1.5 times and sixth 1.6 times broader than long, lateral borders divided by broad and deep gap into two lobes, anterior lobe slightly crenulate along total length, posterior lobe crenulate only at distal third, caudal edges of pereonites rounded, formed by dorsal parts of pereopodal coxae.

All five pleonites of equal size, epimera pointed and backwardly directed, bearing plumose setae laterally and dorsally, width four times length (including epimeres). Pleotelson at least twice as long as wide; dorsally on each side close to lateral margin with seven barbed setae; with four lateral projections, each bearing 1-2 barbed setae; caudal margin bent inwards, therefore prominent caudal point in line with the outer edges of pleotelson.

Antenna 1 (Fig. 1). Peduncle with four segments; first segment long, length about 4.3 times width; inner margin with spine-like projection at proximal and distal third, proximal projection bearing in its angle four long setae, distal projection with five setae, proximally with several tiny projections and single small seta, one further seta at midlength between both projections, finally one seta distally; outer margin with group of three feathered hairs proximally, one seta and two feathered hairs in intermediate position, distally with group of five feathered hairs and two long setae; second segment distinctly shorter, elongate, length 2.6 times width, inner margin with two setae proximally and group of one short, three long setae as well as two feathered hairs distally, inner margin with group of three setae and two feathered hairs distally; third peduncular segment only half length of second, nearly twice as long as broad, inner margin with spine-like structure at midlength, three small setae distally, outer margin with one long seta only distally; fourth segment small, with extension for inner flagellum, with two feathered hairs, outer flagellum long, 9-segmented, first segment short, slightly longer than broad, without any setae, second to sixth of about equal size,

about 2.5 times as long as wide, third and fifth without setae, second with two small setae, fourth with one feathered hair and three small setae, sixth with one aesthetasc and three small setae, seventh with one small seta, eighth to ninth segment small, about three times as long as wide, eighth with one aesthetasc, one long and two short setae, nine with terminally one feathered hair and three setae; inner flagellum about half the length of outer flagellum, 4-segmented, all segments of equal size, slender, about four times as long as wide, first segment with two setae, second without setae, third with one feathered hair and one seta, fourth segment with one feathered hair and three setae terminally.

Antenna 2 (Fig. 1). Peduncle 5-segmented, flagellum probably 7-segmented; first segment short, extended medially, extension bearing three small spine-like projections, with two small setae along inner margin, 3 - 4 small projections at the tip and further projections close to articulation of next segment; second peduncular segment elongate, 2.3 times as wide, inner margin proximally with three spine-like projections, two setae, distally with two projections, with one seta close by, outer margin distally with seale and one tiny seta, seale elongate, 3.3 times as long as wide, surrounded by eight long unbarbed setae; third segment annular, inner margin with two tiny spine-like projections, one long seta distally; fourth segment elongate, 2.5 times as long as wide, inner margin with two feathered hairs, one seta at midlength; fifth peduncular segment 3.4 times as wide, with one seta, one feathered hair at midlength; fifth peduncular segment 3.4 times as long as wide, with one seta, one feathered hair at midlength, distally with two long feathered hairs on inner margin and two long setae, outer margin with one long feathered hair; first flagella segment with signs of subdivision, 3.1 times as long as wide, with one long seta at midlength, one distally; second segment also showing signs of subdivision (unable to determine if both sub-units are really separate), both sub-units about twice as long as broad, first with two small setae, second with one long and three typical setae; third to seventh flagellar segments of similar shape and size, slender, 3-4 times as long as wide, third with one seta, fourth with distal setae, fifth with three setae and one feathered hair, sixth with two setae, seventh segment with five setae terminally.

Clypeolabral-complex (Fig. 2). With one strong rostrally directed spine-like projection; proximal edges and frontal margin of labrum with fine setules.

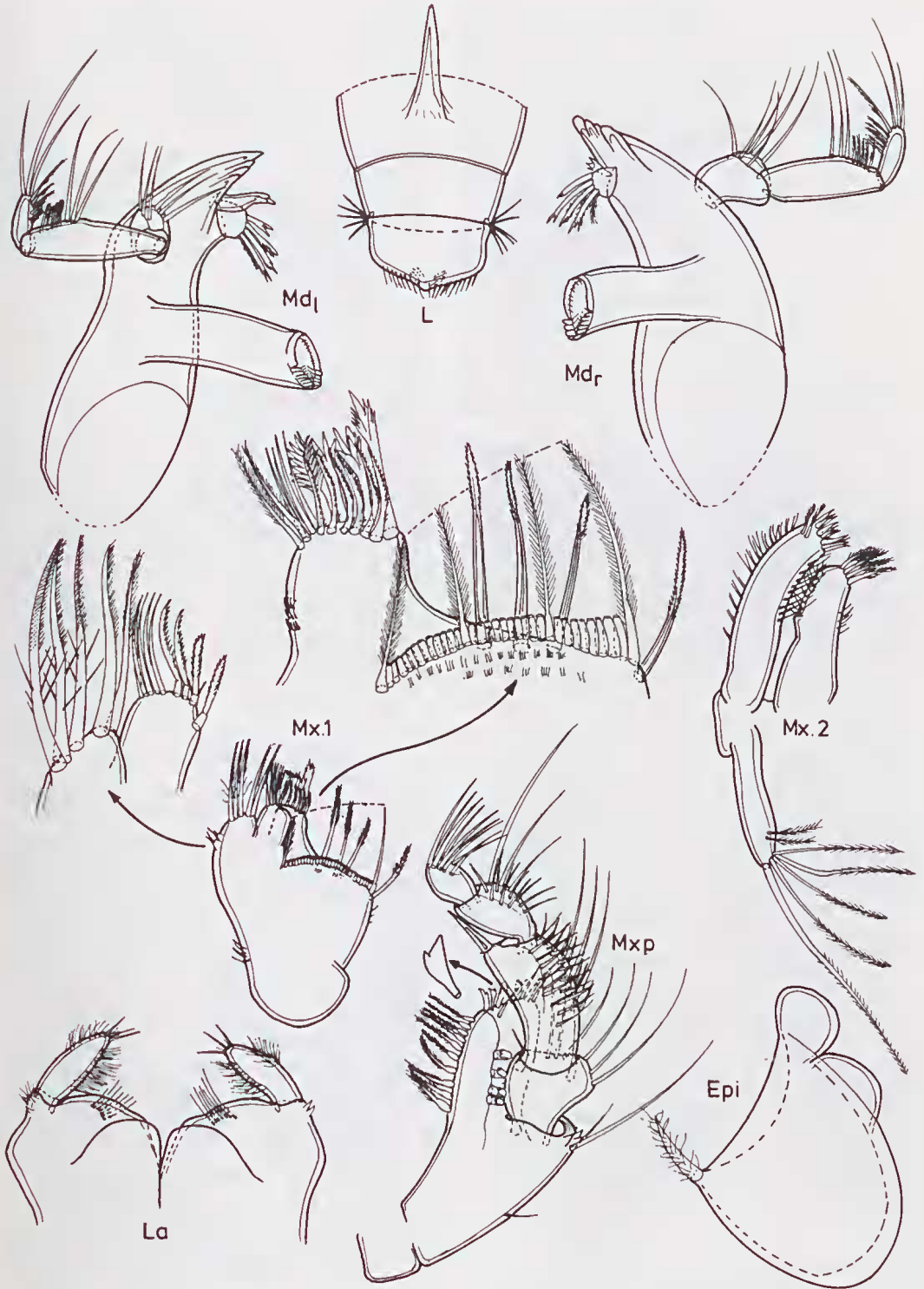


Fig. 2. *Bilobatus crenulatus* gen. et sp. nov., female, paratype, mandibles, maxillae, labrum and epignath.



Fig. 3. *Bilobatus crenulatus* gen. et sp. nov., female, paratype, details of distal part of left and right mandibles.

Mandibles (Figs 2, 3). Well developed, monocondyle; pars molaris, well developed, with broad grinding area, surrounding wall about one third serrated; palpus 3-segmented, first segment short, inner margin with two rows each of three setae, second segment elongate, nearly four times as long as broad, distal third of inner margin with three long setae, row of five smaller plumose setae, third segment only half as long as the second, slender, about twice as long as broad, distal part of inner margin with row of increasingly longer barbed setae, with three long setae terminally; spine-row (Fig. 3) located on lobe, consisting of four strong, multi-pointed spines as well as single barbed setae; lacinia mobilis well developed on left mandible (Fig. 3), represented by broad plate-like structure, with at least three edges; lacinia mobilis of right mandible (Fig. 3) reduced to a strong 3-pointed spine, place of insertion uncertain, probably on corpus mandibularis, but possibly on lobe of spine-row.

Maxilla 1 (Fig. 2). Consisting of inner and outer endite with 1-segmented palpus; inner endite on outer margin with earinate projection midlength, groups of fine setules dorsally, terminally with four barbed spine-like setae; outer endite with eleven terminal spines, outer row consisting of three, middle and inner row each with four spines, two barbed setae close by, outer margin covered with setules; palpus with one long, two short, four longer, terminally barbed setae.

Maxilla 2 (Fig. 2). Consisting of two movable outer lobes and one immovable inner lobe; first outer lobe proximally with two bulb-like projections, each with two tiny setae, distally with five

long setae, outer three with some additional basal setules; second with probably five spine-like setae, four leaf-shaped, laterally incised spines; inner lobe at outer edge with two barbed and about four unbarbed setae, with caudal row of six leaf-shaped, laterally incised spines, rostral row with one broad, laterally incised ("tree-like") spine and three multi-pointed spines; inner distal part with caudal row of about 34 plumose setae and rostral row of three serrated spines on the distal third; one additional serrate spine at distal edge.

Labium (Fig. 2). Of typical shape, with inner lobe small and outer lobe with one-segmented palpus; outer lobe on outer margin distally with 2 - 3 thin spine-like projections, inner distal margin with group of setules at midlength; palpus terminally with three setae, inner margin and distal third of outer margin covered with setules.

Maxilliped (Fig. 2). Medially unfused, coxa lacking setae; basis about twice as long as broad, distally with two setae close to articulation of palpus; endite well developed, rostrally bent medial margin with row of about ten barbed setae, caudal part of medial margin with four coupling hooks, distal inner seta of typical shape, not transformed, distal margin with four translucent bulb-like structures and 3 - 4 setae; palpus 4-segmented; first segment annular, with one short, four long setae; second elongate, about twice as long as broad, outer margin distally with strong spine, inner margin with at least three rows of setae, inner row consisting of about seven setae, middle row consisting of about 13 setae, and outer row consisting of about seven setae (the three additional long setae may also

belong to the outer row or may form a fourth row); third palpal segment shorter, about 1.5 times as long as wide, inner margin with three rows of setae, inner row consisting of three setae, middle row having seven setae, outer row formed by three long setae; fourth segment axe-shaped, bearing semicircular row of nine setae.

Epignath (Fig. 2). Of typical apseudoidean shape, consisting of main lobe with two smaller accessory lobes; main lobe cup-shaped, with translucent, plumose spine-like projection terminally.

Cheliped (Fig. 1). Small, slender, with exopodite; basis elongate, club-shaped, about 2.6 times as long as wide, tergal border proximally with 3-segmented palpus with four long plumose setae only on short third segment, sternal border in proximal third with 5 - 6 setae, one spine at midlength, three setae distally; ischium lacking; merus more or less triangular, sternal margin with group of four setae, with three tiny spines close by; carpus narrow, elongate, about 6.1 times as long as wide, tergal border proximally with group of about seven setae, with two setae distally, between these two groups on rostral margin row of four and on caudal margin row of six setae; sternal border with proximal group of five setae, rostral margin with row of

five setae and caudal margin with row of four setae; propodus with well developed fixed finger which is as long as dactylus; tergal margin of propodus with two setae at midlength and one distal seta, fixed finger well developed, as long as palm, with a terminal spine, with two caudal and one rostral seta close to articulation of dactylus, tergal margin covered by seven distally blunt seta-like structures, sternal margin with row of six setae; dactylus curved, as long as fixed finger, with one small proximal, three longer distal setae, terminal spine well developed.

Pereopod 1 (Fig. 4). Laterally flattened, of digging type, exopodite lacking; coxa annular; basis strong, short, about 1.8 times as long as wide, tergal and sternal margin proximally with group of about 4 - 5 small setae, tergal margin distally with one spine, two setae; ischium separate, small, annular, tergal margin with two small setae; merus elongate, triangular, 1.5 times as long as wide, rostral margin distally with group of five setae, tergal border with one spine and three setae distally, along caudal margin of sternal border with row of 6 - 7 setae, sternal border distally with one large, strong spine, with three setae; carpus of typical shape, tergal border with two strong spines, first accompanied by five setae, second by two setae, sternal border with

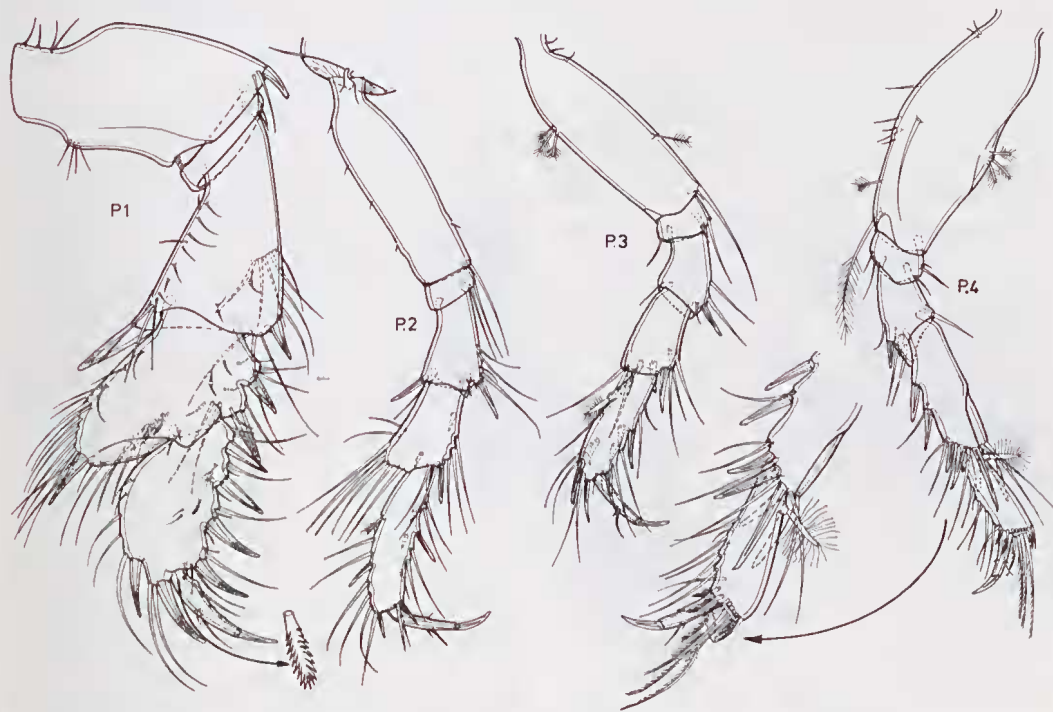


Fig. 4. *Bilobatus crenulatus* gen. et sp. nov., female, paratype, pereopods 1-4.

row of 14 - 16 setae, one distal spine, rostral margin distally with group of three setae, caudal margin with row of about eight setae, two probably barbed; propodus blade-like, tergal border with row of four strong spines, in front of five setae, distally with two strong spines, second spine accompanied by two long setae, one tiny rostral serrate spine near articulation of dactylus; dactylus with terminal spine, curved, sternal border with two setae, ventral border with one seta, some fine spinules.

Pereopod 2 (Fig. 4). Slender, nonfossorial; coxa circular, with one seta; basis elongate, about 3.9 times as long as wide, sternal border with four tiny setae, tergal border with one tiny, one long seta; ischium annular, tergal border with two long setae; merus about 1.45 times as long as wide, bent sternally, tergal border distally with four setae, one feathered hair, one long and two small spines, sternal border distally with one spine and one seta; carpus 1.5 time as long as wide, rostral margin with two small spines, tergal border distally with one spine and five setae, sternal border with distal row of eight setae; propodus slender, about four times as long as wide, tergal border with rows of five setae and one spine, distally with one spine, one rostral seta, one caudal seta, sternal border covered by row of one feathered hair, six setae, two spines; dactylus with terminal spine, curved, reaching half length of propodus, sternal margin with two setae, tergal margin with 1-2 tiny setules.

Pereopod 3 (Fig. 4). Similar in proportion and armament to P.2; tergal border of basis with one, sternal border with three feathered hairs; ischium with additional seta on sternal border; merus lacking sternal spine; carpus with reduced number of setae along sternal border; propodus with strongly developed feathered hair at about 0.3 of sternal border, rostral margin with three small spines.

Pereopod 4 (Fig. 5). Coxa annular, not fused to pereonite, with one seta; basis somewhat thickened, nearly three times as long as broad, tergal border with two small proximal setae, one long and five small setae at midlength, one feathered hair in distal third, one long plumose seta terminally, sternal border with three feathered hairs at mid-length; ischium annular, tergal border with two setae, sternal border with three setae; merus more or less triangular, sternal border with one strong seta distally, tergal margin distally with two spines, four setae; carpus elongate, about three times as long as wide,

tergal border with two spines, one seta, rostral, distal as well as caudo-distal row each consisting of three spines, four setae; propodus also three times as long as wide, tergal border covered by row of seven setae, sternal border with outer semicircular row of about 20 serrate spinules, inner group of five barbed longer setae; dactylus with terminal spine, as in P.3.

Pereopod 5 (Fig. 5). Similar in shape and proportions to P.4, but different in armament; basis with additional four long plumose setae along tergal border; merus with three spines and four setae on tergal border; tergal border of carpus with four spines; one seta, distal spine rows reduced, only two spines, five setae present; propodus distally without semicircular rows of serrate spines, sternal border also with strong feathered hair, rostral margin of tergal border with row of four setae, one spine, caudal margin with row of four spines, two setae; dactylus and terminal spine as in P.4.

Pereopod 6 (Fig. 5). Slender, but modified; basis about 2.9 times as long as wide, tergal border covered with row of seven strong plumose setae, sternal margin proximally as well as distally with five plumose setae, with three small feathered hairs additionally; ischium annular, tergal border with one plumose seta; merus short, 1.6 times as long as wide, sternal border at midlength with one seta, distally with four plumose setae, tergal border covered by row of six plumose setae, caudal margin with one small spine and two small plumose setae; carpus 2.1 times as long as wide, tergal border with two spines, five plumose setae, sternal border with one distal spine, row of plumose setae, caudal margin with two small spines, two normal and two plumose setae; propodus shorter than carpus, about 2.5 times as long as wide, caudal margin with three spines, distally with one additional spine close to articulation of dactylus, tergal border with one spine, additionally distal third and distal propodal part covered by row of about 25 small serrate spines; dactylus and terminal spine similar to P.5.

Pleopods (Fig. 5). All five pairs of pleopods of same shape; protopodite small, 1-segmented, outer margin with four long plumose setae; endopodite 1-segmented, slender, nearly eight times as long as broad, distal half of outer margin covered with smaller plumose setae, inner margin densely covered with plumose setae, most proximal setae plumose, stronger than others; exopodite 1-segmented, slender, longer than

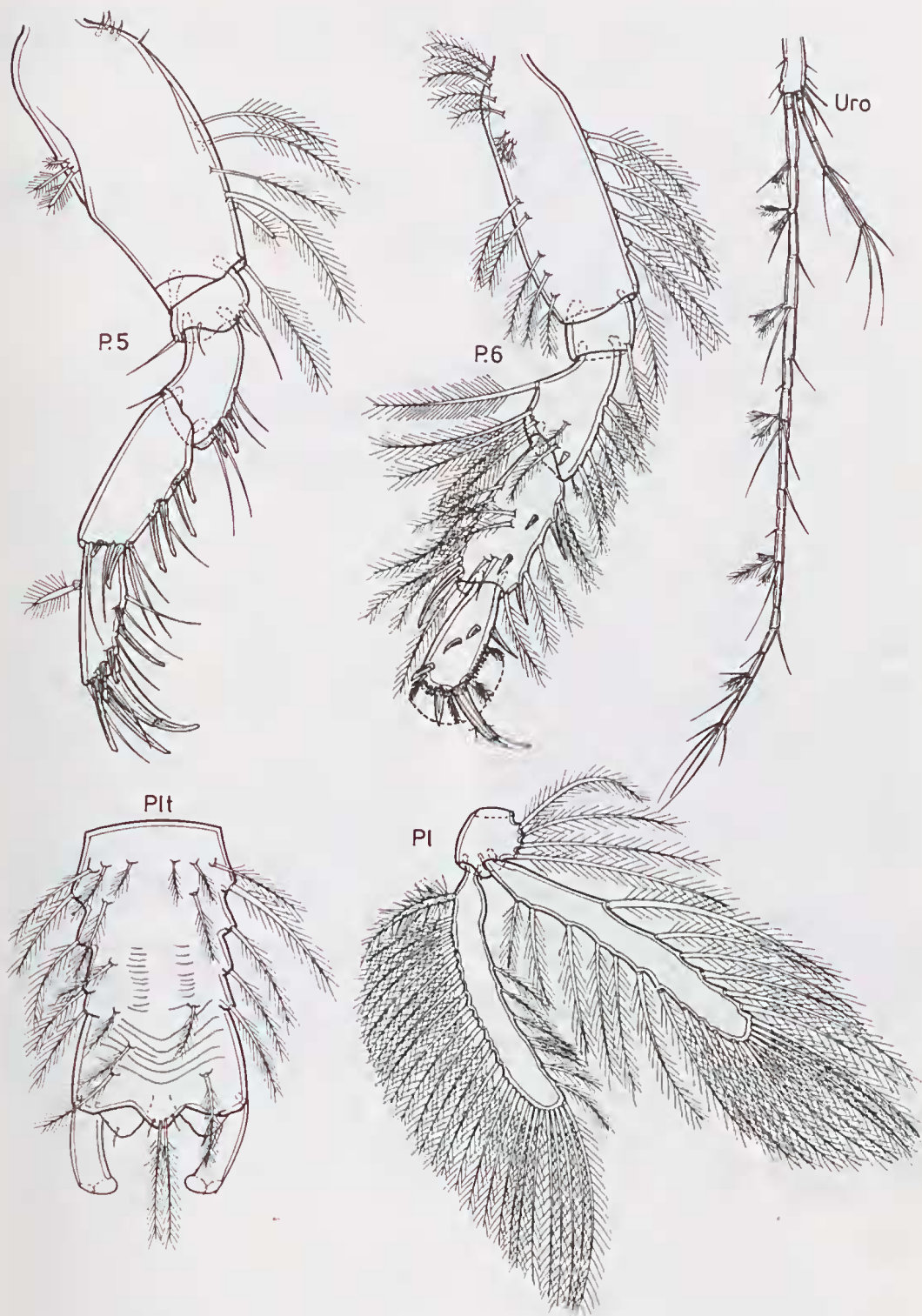


Fig. 5. *Bilobatus crenulatus* gen. et sp. nov., female, paratype, pereopods 5-6, uropod, pleopod and pleotelson.

endopodite, 9.5 times as long as wide, distal half of outer margin covered with long plumose setae, proximal half of inner margin sparsely, distal part densely covered with plumose setae.

Uropods (Fig. 5). Biramous, filamentous; basis small, twice as long as broad, distal half with 7 - 9 small setae; endopodite long, segmentation not always clear, probably with about seven larger sub-units each consisting of several segments: first unit consisting of annular first segment without any setae, next two segments indistinct, about four times as long as wide, first bearing one feathered hair, second two feathered hairs and one seta; second sub-unit probably with two segments, also about four times as long as broad, first segment bearing one seta, second two feathered hairs and one seta; third sub-unit consisting of 2 - 3 segments, first about four times as long as broad, one terminal seta, second and third sub-units indistinct, three times as long as wide, second with one seta, third with two feathered hairs, two setae; fourth sub-unit long, containing 4 - 6 segments, first and second indistinct, four times as long as broad, no setae, third three times as long as broad, one seta, fourth and fifth indistinct, each three times as long as broad, one distal seta, sixth about four times as long as broad, distally with three feathered hairs, one seta; fifth sub-unit consisting of three segments, all about three times as long as wide, one distal seta; sixth sub-unit consisting of two segments, both three times as long as broad, first segment with one seta, second with one feathered hair, setae; seventh sub-unit also with two segments similar to the two foregoing, only second segment with three longer and two shorter terminal setae; exopodite short, slender, probably 5-segmented; first segment short, without setae; second and third segments four times as long as broad, only third with two setae distally; fourth and fifth segments similar to two previous ones, only last segment with two longer and two shorter setae terminally.

Etymology. The species-name *crenulatus* refers to the crenulated anterior lobe of pereonites 4 - 6.

Distribution. Northern Territory, Australia; intertidal to 4 m.

Remarks. One of the specimens had two small bivalves attached to the ventral side of the last two pereonites. Nothing is known about this kind of commensalism in the order Tanaidacea.

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